

Amendments to the claims:

Cancel claims 6, 16, 21-24, 26, 31-34 and 44-52.

1. - 6. (Cancelled)

7. (Previously Presented) A spin valve transistor comprising:

an emitter;

a collector;

a base between the emitter and the collector;

a spin valve including:

a ferromagnetic free layer structure composed of iron (Fe);

a self-pinned antiparallel (AP) pinned layer structure;

a nonmagnetic spacer layer between the free layer structure and the AP pinned layer structure; and

the free layer structure interfacing the spacer layer;

the base comprising at least said free layer structure;

the self pinned AP pinned layer structure including:

a ferromagnetic first antiparallel (AP) pinned layer;

a ferromagnetic second antiparallel (AP) pinned layer; and

a nonmagnetic antiparallel coupling (APC) layer located between the first and second AP pinned layers;

the first AP pinned layer being composed of iron (Fe) and interfacing the spacer layer;

the second AP pinned layer including:

an iron (Fe) film;

a cobalt iron (CoFe) film with a positive magnetostriction;

the iron (Fe) film being located between and interfacing the APC layer and the cobalt iron (CoFe) film; and

the CoFe film having a magnetostrictive anisotropy field that is oriented perpendicular to a head surface of the spin valve transistor for self pinning the AP pinned layer structure.

1 8. (Original) A spin valve transistor as claimed in claim 7 wherein the cobalt iron
2 is $\text{Co}_{90-50}\text{Fe}_{10-50}$.

1 9. (Previously Presented) A spin valve transistor as claimed in claim 7 wherein the
2 cobalt iron (CoFe) film is $\text{Co}_{50}\text{Fe}_{50}$.

1 10. (Original) A spin valve transistor as claimed in claim 9 wherein the first and
2 second AP pinned layers have the same magnetic thickness.

11. - 16. (Cancelled)

1 17. (Previously Presented) A magnetic head assembly comprising:
2 a write head;
3 a read head adjacent the write head;
4 the read head including:
5 ferromagnetic first and second shield layers; and
6 a spin valve transistor located between the first and second shield layers;
7 the spin valve transistor comprising:
8 an emitter;
9 a collector;
10 a base between the emitter and the collector;
11 a spin valve including:
12 a ferromagnetic free layer structure composed of iron (Fe);
13 a self-pinned antiparallel (AP) pinned layer structure;
14 a nonmagnetic spacer layer between the free layer structure and the AP pinned
15 layer structure; and
16 the free layer structure interfacing the spacer layer;
17 the base comprising at least said free layer structure;
18 the self pinned AP pinned layer structure including:
19 a ferromagnetic first antiparallel (AP) pinned layer;
20 a ferromagnetic second antiparallel (AP) pinned layer; and

21 a nonmagnetic antiparallel coupling (APC) layer located between the first and second
22 AP pinned layers;
23 the first AP pinned layer being composed of iron (Fe) and interfacing the spacer layer;
24 the second AP pinned layer including:
25 an iron (Fe) film;
26 a cobalt iron (CoFe) film with a positive magnetostriction;
27 the iron (Fe) film being located between and interfacing the APC layer and the cobalt
28 iron (CoFe) film; and
29 the CoFe film having a magnetostrictive anisotropy field that is oriented
30 perpendicular to a head surface of the spin valve transistor for self pinning the AP pinned
31 layer structure.

1 18. (Previously Presented) A magnetic head assembly as claimed in claim 17 wherein
2 the cobalt iron is $\text{Co}_{90-50}\text{Fe}_{10-50}$.

1 19. (Previously Presented) A magnetic head assembly as claimed in claim 17 wherein
2 the cobalt iron is $\text{Co}_{50}\text{Fe}_{50}$.

1 20. (Original) A magnetic head assembly as claimed in claim 19 wherein the first and
2 second AP pinned layers have the same magnetic thickness.

21.- 26. (Cancelled)

1 27. (Previously Presented) A magnetic disk drive comprising:
2 at least one magnetic head assembly that has a head surface;
3 the magnetic head assembly having a write head and a read head;
4 the read head including:
5 ferromagnetic first and second shield layers; and
6 a spin valve transistor located between the first and second shield layers;
7 the spin valve transistor comprising:

an emitter;
a collector;
a base between the emitter and the collector;
a spin valve including:
a ferromagnetic free layer structure composed of iron (Fe);
a self-pinned antiparallel (AP) pinned layer structure;
a nonmagnetic spacer layer between the free layer structure and the AP pinned layer structure; and
the free layer structure interfacing the spacer layer;
the base comprising at least said free layer structure;
the self pinned AP pinned layer structure including:
a ferromagnetic first antiparallel (AP) pinned layer;
a ferromagnetic second antiparallel (AP) pinned layer; and
a nonmagnetic antiparallel coupling (APC) layer located between the first and second AP pinned layers;
the first AP pinned layer being composed of iron (Fe) and interfacing the spacer layer;
the second AP pinned layer including:
an iron (Fe) film with a positive magnetostriction;
a cobalt iron (CoFe) film;
the iron (Fe) film being located between and interfacing the APC layer and the cobalt iron (CoFe) film; and
the CoFe film having a magnetostrictive anisotropy field that is oriented perpendicular to a head surface of the spin valve transistor for self pinning the AP pinned layer structure;
a housing;
a magnetic medium supported in the housing;
a support mounted in the housing for supporting the magnetic head assembly with said head surface facing the magnetic medium so that the magnetic head assembly is in a transducing relationship with the magnetic medium;
a motor for moving the magnetic medium; and
a processor connected to the magnetic head assembly and to the motor for exchanging signals with the magnetic head assembly and for controlling movement of the magnetic medium.

1 28. (Original) A magnetic disk drive as claimed in claim 27 wherein the cobalt iron is
2 $\text{Co}_{90-50}\text{Fe}_{10-50}$.

1 29. (Previously Presented) A magnetic disk drive as claimed in claim 27 wherein the
2 cobalt iron is $\text{Co}_{50}\text{Fe}_{50}$.

1 30. (Original) A magnetic disk drive as claimed in claim 29 wherein the first and
2 second AP pinned layers have the same magnetic thickness.

31. - 34. (Cancelled)

1 35. (Previously Presented) A spin valve transistor as claimed in claim 9 wherein the
2 base further comprises the self-pinned antiparallel (AP) pinned layer structure and the spacer layer.

1 36. (Previously Presented) A spin valve transistor as claimed in claim 35 further
2 comprising a barrier layer located between the emitter and the base for conducting hot electrodes
3 from the emitter to the base wherein the hot electrons have an energy level above Fermi levels of the
4 layers in said base.

1 37. (Previously Presented) A spin valve transistor as claimed in claim 36 wherein the
2 first and second AP pinned layers have the same magnetic thickness.

1 38. (Previously Presented) A magnetic head assembly as claimed in claim 19 wherein
2 the base further comprises the self-pinned antiparallel (AP) pinned layer structure and the spacer
3 layer.

1 39. (Previously Presented) A magnetic head assembly as claimed in claim 38 further
2 comprising a barrier layer located between the emitter and the base for conducting hot electrodes
3 from the emitter to the base wherein the hot electrons have an energy level above Fermi levels of the
4 layers in said base.

1 40. (Previously Presented) A magnetic head assembly as claimed in claim 39 wherein
2 the first and second AP pinned layers have the same magnetic thickness.

1 41. (Previously Presented) A magnetic disk drive as claimed in claim 29 wherein the
2 base further comprises the self-pinned antiparallel (AP) pinned layer structure and the spacer layer.

1 42. (Previously Presented) A magnetic disk drive as claimed in claim 41 further
2 comprising a barrier layer located between the emitter and the base for conducting hot electrons
3 from the emitter to the base wherein the hot electrons have an energy level above Fermi levels of the
4 layers in said base.

1 43. (Previously Presented) A magnetic disk drive as claimed in claim 42 wherein the
2 first and second AP pinned layers have the same magnetic thickness.

44. - 52. (Cancelled)